

WHAT IS CLAIMED IS:

1 1. An apparatus for collection and lateral flow chromatography of an
2 oral fluid, the apparatus comprising:
3 a lateral flow chromatography strip including a receiving area;
4 a capillary matrix having a surface; and
5 a bite portion coupled to the capillary matrix and insertable between
6 teeth of a subject to position the surface of the capillary matrix for receiving an oral fluid of
7 the subject, the capillary matrix being in communication with the lateral flow
8 chromatography strip to wick up and deliver the received oral fluid to the receiving area of
9 the lateral flow chromatography strip.

1 2. The apparatus of claim 1, wherein the bite portion positions the
2 capillary matrix in a buccal space of the subject.

1 3. The apparatus of claim 1, wherein the capillary matrix is sheet-like in
2 shape and the bite portion comprises a bite plate disposed substantially perpendicular to the
3 capillary matrix.

1 4. The apparatus of claim 1, wherein the bite portion comprises textured
2 surfaces for contacting the teeth.

1 5. The apparatus of claim 1, wherein the bite portion comprises a saliva-
2 stimulating substance.

1 6. The apparatus of claim 5, wherein the saliva-stimulating substance is
2 selected from the group consisting of citric acid, tartaric acid, fumaric acid, ascorbic acid,
3 malic acid, salt, fructose, glucose, sucrose, and artificial sweetener, and aromatic compound.

1 7. The apparatus of claim 1, wherein the bite portion is insertable
2 between the teeth of the subject to contact a tongue of the subject.

1 8. The apparatus of claim 1, wherein the bite portion is insertable
2 between the teeth in proximity to the tongue of the subject

1 9. The apparatus of claim 1, further comprising a housing having a
2 cavity in which the lateral flow chromatography strip is at least partially disposed.

1 10. The apparatus of claim 9, wherein the housing includes at least one
2 inspection site providing visual inspection of reagents at selected sites on the lateral flow
3 chromatography strip.

1 11. The apparatus of claim 9, wherein the housing is connected to the bite
2 portion.

1 12. The apparatus of claim 9, wherein the housing is connected to the
2 capillary matrix.

1 13. The apparatus of claim 9, wherein the capillary matrix is insertable
2 partially into the cavity of the housing which acts as a handle for inserting the capillary
3 matrix into an oral cavity of the subject.

1 14. The apparatus of claim 1, wherein the lateral flow chromatography
2 strip includes lateral flow chromatography reagents.

1 15. The apparatus of claim 1, further comprising a conjugate strip coupled
2 between the capillary matrix and the lateral flow chromatography strip and including lateral
3 flow chromatography reagents.

1 16. The apparatus of claim 1, further comprising a blocking strip coupled
2 between the capillary matrix and the lateral flow chromatography strip and including a
3 detergent.

1 17. The apparatus of claim 16, wherein the blocking strip further includes
2 a buffer.

1 18. The apparatus of claim 1, further comprising an absorbent material
2 coupled near an end of the lateral flow chromatography strip opposite from the capillary
3 matrix.

1 19. The apparatus of claim 1, further comprising a cover for protecting the
2 capillary matrix.

1 20. The apparatus of claim 1, wherein saturation of the capillary matrix
2 with an oral fluid does not substantially alter the morphology of said capillary matrix.

1 21. The apparatus of claim 20, wherein saturation of the capillary matrix
2 with an oral fluid does not substantially alter the average pore size of said capillary matrix.

1 22. The apparatus of claim 20, wherein saturation of the capillary matrix
2 with an oral fluid does not substantially alter the void volume of said capillary matrix.

1 23. The apparatus of claim 20, wherein the capillary matrix has an
2 average pore size ranging from about 40 μm to about 250 μm .

1 24. The apparatus of claim 20, wherein the capillary matrix has a void
2 volume of less than about 60 μL .

1 25. The apparatus of claim 1, wherein the capillary matrix comprises a
2 plastic.

1 26. The apparatus of claim 25, wherein the capillary matrix comprises a
2 plastic selected from the group consisting of a polyethylene (PE), a polyester, a polystyrene,
3 a high density polyethylene (HDPE), an ultra-high molecular weight polyethylene (UHMW),
4 a polypropylene (PP), a polyvinylidene fluoride (PVDF), a polytetrafluoroethylene (PTFE),
5 a nylon 6 (N6), and a polyethersulfone (PES).

1 27. The apparatus of claim 25, wherein the plastic is hydrophilic or
2 treated to be hydrophilic.

1 28. The apparatus of claim 1, wherein the capillary matrix, when
2 contacted to an oral mucosa takes up oral fluid from the subject and releases the oral fluid to
3 the receiving area of the lateral flow chromatography strip in under about 2 minutes.

1 29. The apparatus of claim 28, wherein the capillary matrix, when
2 contacted to an oral mucosa takes up oral fluid from the subject and releases the oral fluid to
3 the receiving area of the lateral flow chromatography strip in under about 30 seconds.

1 30. The apparatus of claim 28, wherein the capillary matrix is saturated
2 with oral fluid in under about 1 minute.

1 31. The apparatus of claim 1, wherein the capillary matrix is saturated by
2 less than about 300 μ L of oral fluid

1 32. The apparatus of claim 31, wherein the capillary matrix is saturated by
2 less than about 100 μ L of oral fluid.

1 33. The apparatus of claim 1, wherein the capillary matrix releases the
2 oral fluid to the receiving area of the lateral flow chromatography strip without compression
3 of the capillary matrix.

1 34. The apparatus of claim 33, wherein sufficient oral fluid is released to
2 saturate the receiving area.

1 35. An apparatus for collection and lateral flow chromatography of an
2 oral fluid, the apparatus comprising:
3 a lateral flow chromatography strip including a receiving area;
4 a bite portion insertable between teeth of a subject; and
5 collection means coupled to the bite portion to contact an oral mucosa
6 of the subject for receiving oral fluid of the subject, and in communication with the lateral
7 flow chromatography strip for wicking up and delivering the received oral fluid to the
8 receiving area of the lateral flow chromatography strip.

1 36. The apparatus of claim 35, wherein the bite portion comprises a
2 saliva-stimulating substance.

1 37. The apparatus of claim 35, wherein the bite portion is insertable
2 between the teeth of the subject to contact a tongue of the subject.

1 38. The apparatus of claim 35, wherein the bite portion is insertable
2 between the teeth of the subject in proximity to a tongue of the subject.

1 39. The apparatus of claim 35, further comprising conjugate means,
2 coupled between the collection means and the lateral flow chromatography strip, for
3 providing lateral flow chromatography reagents.

1 40. The apparatus of claim 35, further comprising adjusting means,
2 coupled between the collection means and the lateral flow chromatography strip, for
3 adjusting a pH of the received oral fluid.

1 41. The apparatus of claim 35, further comprising blocking means,
2 coupled between the collection means and the lateral flow chromatography strip, for
3 blocking unwanted substances from the collection means.

1 42. The apparatus of claim 35, further comprising blocking means,
2 coupled between the collection means and the lateral flow chromatography strip, for
3 preventing backflow of reagents or oral fluid from the lateral flow chromatography strip to
4 the collection means.

1 43. The apparatus of claim 35, further comprising absorbent means
2 coupled to the lateral flow chromatography strip for receiving the oral fluid from the
3 collection means to prevent backflow thereof to the collection means.

1 44. The apparatus of claim 35, wherein the bite portion is held in place by
2 occlusal force of the teeth to position the collection means for receiving the oral fluid.

1 45. A method of detecting an analyte in oral fluid of a subject, said
2 method comprising:
3 inserting the apparatus of claim 1 or claim 35 into the oral cavity of
4 said subject such that said bite portion is held between the teeth of said subject;
5 retaining said apparatus in said oral cavity until an oral fluid sample is
6 collected; and
7 reading the presence or absence of said analyte from an indicator
8 region on said apparatus.

1 46. A kit for detection of an analyte in oral fluid of a subject, said kit
2 comprising a container containing the apparatus of claim 1 or the apparatus of claim 35.

1 47. The kit of claim 46, further comprising instructional materials
2 describing the use of said apparatus for detecting said analyte.